5. Influence of Carbon.
The exact numerical determination of the influence of carbon on the heat requirement presents great difficulty, since the quantity of slag which proceeds from elimination of
•
carbon and therewith also the loss of charge do not admit 'j
of being determined.
'jj
The figures found are herein based on the wear of the furnace, and the total carbon content is taken into account without regard to the effective amount. Actually the wear and tear of the furnace increases with the rise of carbon content. The values given for this wear and tear by the formula 80c, 80n and 8lA are founded, however, on a carbon content of the charge of 4 per cent, and are thus able to be regarded as maximum values for charges regularly used.
If, therefore, from (48) the total carbon content, which now assume at 4 per cent., gives rise to 2*15 per cent, slag and 0*2 per cent, iron loss, so there will result due to 1 per cent.
C,
2" in
—= -v (>5 per cent, slag with 0*05 per cent. Fe (always
taken on the weight of the metallic charge).
According to this, from a charge of 99 kilogrammes Fe and 1 kilogramme 0, one must obtain 98*95 kilogrammes metal and 0"f> kilogramme slag. For the production of the latter no limestone is necessary, since the base is derived from material of the bottom.
The available heat of the products is then:
98-9f> kilogrammes stoolx 350.....= 34,(532
()\5 kilogrammes nlagx&2>> . - « • = 203
CO from 1 kilogramme C..... 800
Total hoat of prod nuts . . . 35,(>95
By the reactions are liberated
from 1 kilogramme (J . . '2,387
(H)i> kilogrammo KoX 1,353 . ~™ 07 By combination of SiOa with GaO
(from5B)~45x384 . = 42
2,496 2,496
Therefore to be supplied by furnace . . . 33,199
Or per kilogramme steel '^—11=336 calories. *